D'où :

$$g_{n+1}(x) = \left[t^{2n+1}\sqrt{t^2-4}\right]_{2\sqrt{2}}^{x} - (2n+1)\int_{2\sqrt{2}}^{x} t^{2n}\sqrt{t^2-4}\,dt$$

$$g_{n+1}(x) = x^{2n+1}\sqrt{x^2-4} - 2^{3n+2}\sqrt{2} - (2n+1)\int_{2\sqrt{2}}^{x} t^{2n}\sqrt{t^2-4}\,dt$$

b)

$$g_{n+1}(x) = x^{2n+1}\sqrt{x^2-4} - 2^{3n+2}\sqrt{2} - (2n+1)\int_{2\sqrt{2}}^{x} \frac{t^{2n+2}-4t^{2n}}{\sqrt{t^2-4}}\,dt$$

$$g_{n+1}(x) = x^{2n+1}\sqrt{x^2-4} - 2^{3n+2}\sqrt{2} - (2n+1)\left[g_{n+1}(x) - 4g_n(x)\right]$$

$$\Rightarrow (2n+2)\,g_{n+1}(x) = x^{2n+1}\sqrt{x^2-4} - 2^{3n+2}\sqrt{2} + 4(2n+1)\,g_n(x)$$

c) passage aux limites lorsque $x \longrightarrow 2^+$

on aura :

$$(2n+2)\,\ell_{n+1} = 4(2n+1)\,\ell_n - 2^{3n+2}\sqrt{2}$$

$$\ell_{n+1} = \frac{2.(2n+1)}{n+1}.l_n - \frac{2^{3n+1}.\sqrt{2}}{n+1}$$

Qarray.tn -Aqra Blech- Qarray.tn